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60/393,451 3 July 2002 (03.07.2002) US(71) Applicant (for all designated States except US): **UNIVERSITY OF CENTRAL FLORIDA** [US/US]; Office of Technology Transfer, 4000 Central Florida Boulevard, Orlando, FL 32816-0150 (US).

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(75) Inventor/Applicant (for US only): **DANIELL, Henry** [US/US]; 1440 Pelican Bay Trail, Winter Park, FL 32792 (US).(74) Agents: **CHRISTENBURY, T., Daniel et al.**; Piper Rudnick LLP, 3400 Two Logan Square, 18th and Arch Streets, Philadelphia, PA 19103 (US).(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**Published:**

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(88) Date of publication of the international search report:
21 October 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PHYTOREMEDIATION OF CONTAMINANT COMPOUNDS VIA CHLOROPLAST GENETIC ENGINEERING

(57) Abstract: A plastid transformation vector for stably transforming a plastid genome, comprising, as operably-linked components, a first flanking sequence, at least one DNA sequence coding for a polypeptide suitable for remediating a contaminant compound, and a second flanking sequence, wherein a plant is stably transformed with the plastid transformation vector, and the plant is capable of phytoremediating a contaminant compound.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/20868

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A01H 5/00, 5/10; C12N 15/82

US CL : 435/320.1; 800/278, 298, 288

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/320.1; 800/278, 298, 288

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/64024 A1 (AUBURN UNIVERSITY) 07 September 2001 (07.09.2001), see entire document.	1-25, 29-31 and 35-37
X	WO 99/10513 A1 (AUBURN UNIVERSITY) 04 March 1999 (04.03.1999), pg 14, 39-41, claims 123-153	1 and 3-25

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Further documents are listed in the continuation of Box C.

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See patent family annex.

* Special categories of cited documents:

"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

30 September 2003 (30.09.2003)

Date of mailing of the international search report

01 DEC 2003

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INTERNATIONAL SEARCH REPORT

PCT/US03/20868

Continuation of B. FIELDS SEARCHED Item 3:

Agricola, Biosis CaPlus CABA, USPAT, EPO, JPO, Derwent

Search terms: (chloroplast or plastid) transform?, mer operon, phytoremediate,

INTERNATIONAL SEARCH REPORT

International application No.

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Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 34
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claim 34 is dependent upon claim 45, which does not exist.
3. ☒ Claim Nos.: 26-28,32 and 33
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

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☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.